DOCUMENT RESUME

ED 466 165 IR 021 236

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TITLE	Different Levels of Internet Integration in University Academic Activities: Examples and Pedagogical Implications.
PUB DATE	2001-06-00
NOTE	6p.; In: ED-MEDIA 2001 World Conference on Educational Multimedia, Hypermedia & Telecommunications. Proceedings (13th, Tampere, Finland, June 25-30, 2001); see IR 021 194.
PUB TYPE	Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Mediated Communication; *Distance Education; Educational Technology; Foreign Countries; Higher Education; *Internet; Learning Activities; Nontraditional Education; Teaching Methods; *Technology Integration
IDENTIFIERS	*Technology Implementation

ABSTRACT

In the four examples of pedagogic integration of the Internet in a "multimodal" university situation reported in this paper, an innovative process is illustrated whose central objectives were improvement of the quality and relevance of the training strategies provided to students. This paper contributes to the characterization of the Internet integration continuum, from enhancing a traditional course with a minimal integration of Internet (level 1) to a complete integration in the form of what has been called a virtual campus (level 3). The paper suggests that the more or less intensive use of distance communication in the various modalities of integration does not reflect the quality of the learning. Whatever the level of integration of the Internet to the system, coherence of the proposed activities and pedagogic value of the tools implemented are the most determining factors for success. (Author/AEF)

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ED 466 165

Different Levels of Internet Integration in University Academic Activities: examples and pedagogical implications

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Abstract: In the four examples of pedagogic integration of Internet in a "multimodal" university situation reported herein, we bring into light an innovative process whose central objectives were improvement of the quality and relevance of the training strategies provided to students. This article will contribute to the characterization of the Internet integration continuum, from enhancing a traditional course with a minimal integration of Internet (level 1) to a complete integration in the form of what has been called a virtual campus (level 3). We suggest that the more or less intensive use of distance communication in the various modalities of integration does not reflect the quality of the learning. Indeed, we are convinced that, whatever the level of integration of Internet to the system, coherence of the proposed activities and pedagogic value of the tools implemented is the most determining factors for success.

1. Introduction: Levels of Internet integration in the university syllabus

The "unimodal" university, that is an institution almost exclusively dedicated to open and distance training or learning, is a familiar form of the use of Internet in university curricula. Students there are mostly involved in courses mediated through remote access. The mission of the unimodal university is clear and exclusive. Here, the integration of Internet is seen as the logical end to the evolution of pedagogical means. Despite this technological bias, the training often continues to rest mostly on the traditional media, even in the most avant-garde universities in this field, such as the British Open University and the Télé-Université (UQAM).

At the outskirts of these dedicated universities, more traditional institutions have begun integrate the use of Internet at different levels in their various syllabi. Those "multimodal" universities exploit the potential fir modern remote communications in some courses or some classes while continuing to dispense courses on their premises by the traditional method. Because of their pedagogic use of Internet, multimodal universities are generally endowed with a much more diversified teaching strategies than are unimodal institutions. The implementation of Internet-based pedagogy is often the result of individual initiatives by energetic teachers eager to enhance their pedagogic arsenal. Also, Internet integration is sometimes viewed by academic authorities as the means to attain some short or long term objectives (e.g. increasing student enrollment, reducing costs, improving the offerings). Infrequently, Internet integration may underlie the need to replace outdated teaching strategies as a means of meeting new requirements in a specific professional environment (Rogers, 2000).

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In the four examples of pedagogic integration of Internet in a "multimodal" university situation reported herein, we bring into light an innovative process whose central objectives were improvement of the quality and relevance of the training strategies provided to students. In the first two instances, we describe a first-level integration that can be characterized as the juxtaposition of Internet into a traditional course. The third one pertains to the total integration (level 2) of a complete course in a multimodal university situation. In the last example, we present an integrated device of long distance teaching with Internet (level 3).

2.1 *Practicum*, a case solving system on Internet in a juxtaposition scenario.

We chose the *Practicum* system, which has been in operation for five years at the Faculty of Psychology and Education of the Université de Mons-Hainaut in Belgium, to illustrate the first level of integration of Internet. *Practicum* completes the theoretical part of a course given in class on the learning models given each year to approximately 100 undergraduates. *Practicum* is structured around three functionalities (figure 1). First, a well-defined task, consisting of situation analysis, problem identification, and solution elaboration is provided. Secondly, a set of help tools is given students to assist in the contextualisation of task and approach, and finally there is a distance dialog with the supervisor. Essentially, the system is viewed by the student as an opportunity to put into practice the concepts and principles that have been studied during the theoretical course. This is a classic example of the juxtaposition of Internet into a traditional course.

2.2 "Simul", a medical simulator on Internet in a juxtaposition scenario.

The *Simul* program was developed in the late 1980's for the students of the Faculty of Veterinary Medicine of the Université de Montreal so they could apply their procedural knowledge to the resolution of problems submitted to them in class during the theoretical part of the course. The system has been available to the students for more than 10 years in the context of practical sessions that took place in the computer lab of the faculty. Last year, the system was completely remodeled so it could be put online. The objectives of this transformation were multiple: facilitate the updating of the system, enable the enhancement of interactivity and, most of all, allow distance access to the simulator. This new version of *Simul* is based exclusively on databases, which allows for a personalized monitoring of the students' work and a feedback adapted to each situation. Before being allowed to take the final exam, each student is required to complete, within six work session, all the 15 clinical cases of the *Simul* program in accordance with prescribed steps for resolution of problems in veterinary medicine. A supervisor is made available for the students at specified times to answer questions. Students also have access to the simulator at all times via Internet.

2.3 Learn-Nett, an example of complete class integration to Internet.

This second level of integration of Internet implies a complete restructuring of the pedagogic approaches used in a course. The system allows the creation of a virtual space within which students from five universities in the French part of Belgium and four outside Belgium (Great Britain, Spain, France and Switzerland) can get together to accomplish activities âssociated to the new technologies in education (project Learn-Nett[1]).

The Learn-Nett project is supported by the European Commission via the SOCRATES program. Activities proposed are structured through a website endowed with a number of functionalities devised to further the pooling and sharing of knowledge. To make it more user-friendly, the site is based on a spatial metaphor: the space is divided in three distinct compartments, one public and two private. In one of the private zones, student groups can create a customized work environment in which they work together on their term work. Supervisors can occupy the second private space that gives them access to all the functionalities available to the students as well as to their own specific tools. Within the student's space, some functionalities, such as the public forum and the news are opened to all, but others, such as the private forums and the synchronous communication space are restricted to specific users. This approach can be assimilated to a project pedagogy in which members of a group create a virtual community with the help of communication tools. The supervisor intervenes to facilitate distance interaction, to encourage students to reflect on their approaches, to assure that the deadlines are met and to stimulate the active seeking of information. This course, which is entirely presented on the Internet, is unique to this university, as the rest of the curriculum is taught in the traditional manner.

2.4 The virtual campus, a fully Internet integrated system

The expression "virtual campus" refers to an integrated system of distance learning. This initiative results from a collaboration between the *Université Louis Pasteur* (Strasbourg), *Université de Geneve*, *Université de Dakar* and *Université de Mons-Hainaut* that is financially supported by the *Agence universitaire de la francophonie*. Its purpose is to offer integral training to graduated students from francophone countries outside of Europe, namely Africa, Southeast Asia, the Islands of Indian Ocean, the Caribbean region and the Maghreb.

The course is divided into six modules of which each module comprises a unit. One unit includes two sequences of activities:, one with self-correction, the other with distance supervision. For example, there isone the *conceptoscope* which consists of a virtual space divided into several rooms, including a center of documentation that offers a basic glossary, an office for each student, a meeting room for each group and a bank of maps for the eventual publication of conceptual maps.

The *conceptoscope* was inspired by the constructivist paradigm. The modules are designed to give students the opportunity to learn through discussion of their point of view with their supervisor with respect to the basic glossary, or with their fellow students inside or outside the group. In addition the modules provide the basis for critical analysis of conceptual maps elaborated within each group. Student activities can then be characterized in three areas: elaboration of a student's position with respect to a definition submitted by the supervisor, comparison of the results from each group and finally, negotiation and dialog within the group to obtain consensus on the definition of concepts with respect to the conceptual maps to be submitted. In passing through these three successive stages, students will experience deepening of their understanding of the concepts and, through discussion of the various points of view, they will more readily comprehend the scope of the semantic field associated to the concepts examined.

3- Pedagogic implications of observations made.

Evaluation of the outcome of these projects provided the opportunity to highlight some interesting observations.

Quality of the apprenticeship depend, above all, on appropriateness of the activities offered to students.

As emphasized by Gillette (1996) and, more recently, by Anderson (2000), no matter the level of Internet integration, the appropriateness of all the activities proposed to students with respect to the objectives of the course seems the most important variable. Hence, the decision should not be made on the basis of more or less Internet, but rather of the complementarity of the different pedagogic activities proposed.

Regarding integration of the first level or juxtaposition, important indicators of learning context appropriateness are the degree of success, the good comprehension of theoretical elements and the capacity to put the knowledge into practice . On the other hand, when training takes place in an environment such as a virtual campus (third level of integration), it is of utmost importance to develop pedagogic scenarios coherent with other current training paradigms on the campus. To meet this requirement, it is essential that the virtual campus be built around a clearly identified pedagogic model and that the functionalities available to the learner be coherent within this model. Access to a human supervisor is more important in the context of a virtual campus environment than when isolated activities are involved. The supervisor may step in spontaneously or at the student's request to provide guidance or supplementary information or to orientate research. The supervisor supplies what some authors (Bioca, 1997) call a social presence, which corresponds to the subject's awareness of another person's presence in the context of distance interaction (Scott, 2000).

Quality of the learning depends on the relevance of the tools available to the students.

Use of the different tools included in *Practicum* has been the object of an exhaustive study (De Lievre, 2000). The results of this study have clearly demonstrated that help tools are used according to the expertise level of the students. Hence, low and high performing students more readily use the tools available, in contrast with

intermediate students, who use them significantly less frequently. This observation has been corroborated by other studies (Person et al, 1994) and it can be explained in the case of low-performing subjects by the fact that they are unable to process the situation without resorting to help. The high-performing students realize more fully the benefits they can derive from using the tools. The fact that the use of a certain kind of auxiliary tools can be positively correlated with the expertise of the student it is strong indication that the quality of the training is not entirely based on the nature of the tools available, but also on the subject's capacity to make good use of the tools. The same observations have been made in the case of Simul: students who can process a case more rapidly and more efficiently seem more inclined to use all the tools at their disposal in contrast to other students that fail to grasp the utility of the tools.

In the Learn-Nett system, some tools of dialog seem to have been more frequently employed over others with respect to the evolution of the tasks required. For example, the cafés and the forums were mostly used during the period allowed for the constitution of the group and the selection of the work teams. Later with more personalization of the communication, email became more popular. Very quickly though, the limits of those asynchronous instruments became evident in terms of managing efficiently the process of negotiating special issues relative to common tasks. When it came time to agree on some aspect of the work or to solve problems pertaining to group management, implementation of more interactive forms of exchange appeared indispensable.

Globally, as noted by the authors of the annual report (Learn-Nett, 1999) the use of synchronous communication tools such as the IRC, videoconference (Net-Meeting) and also telephone and personal contact proved crucial at certain times in the evolution of distance cooperation. Those observations seem coherent with others made few years ago (Salgado, 1998) from a quite similar system. The frequency with which synchronous tools were used is, in fact, closely related to the specific evolution of each group. Those who used it most were also the groups that had the most difficulty reaching consensus or, in some cases, those whose collaboration and interactions were the most profound.

The quality of learning depends on the tutor intervention quality and the framework of pedagogic activities.

Studies of the Practicum have stressed the role of the supervisor in the apprenticeship. The results from learners who had access to human supervisors are slightly better than those obtained by learners who did not have this access but the difference observed was not significant. In this context, the proactive intervention of a system supervision (supervising by the program itself) has some effects on the use of tools comparable to those obtained with a human supervisor who could adopt the same proactive attitude. So it seems that, with this type of device, rather than the presence of a human it is the pertinence of the intervention that is most important.

Observing students working with Simul and analyzing the work of a group of students with Learn-Nett has brought to the fore the relevance of supervisor to the great variability in learning quality. These observations lead us to hypothesize that the determining variable in these learning devices is the global level of the framework for the learner's activities. When this is deficient, it seems advisable to plan for a vigorous involvement of the human supervisor, but if the device allows for strong activity framework, the learning process does not seem impaired by less intrusive supervision. As it has been shown by Bandura (1977), social presence is essential to learning by imitation, that is, learning by mimicking the behavior of an expert. The same can be said about other types of learning in which social interactions take place. Such is the case with the socioconstructivist approach where distance interaction with peers reinforces the social presence. Although the effect of social presence on learning has not yet been clearly established, it seems that this factor exerts an influence on motivation and perseverance, as well as on the regulation of activities.

4 Conclusions

The four examples that have briefly presented in this article will contribute to the characterization of the Internet integration continuum, from enhancing a traditional course with a minimal integration of Internet (level 1) to a complete integration in the form of what has been called a virtual campus (level 3). It is important to emphasize that the more or less intensive use of distance communication in the various modalities of integration does not

reflect the quality of the learning. Indeed, we are convinced that, whatever the level of integration of Internet to the system, coherence of the proposed activities and pedagogic value of the tools implemented is the most determining factors for success.

Just as the CD-Rom has not killed the book but rather contributed to diversification of our reading habits, we believe that the Internet-enriched university will be different from the institution we know today. By that, we do not imply the all universities will evolve in virtual institutions, but rather that a diversification of the didactic environment will take place.

For these modifications to happen and most of all to make sure they meet the expectations of students, universities will have to demonstrate flexibility and adaptability so that the various pedagogic approaches can coexist harmoniously. The Internet is surely not a panacea for all existing problems in training and education, as has been sometimes said. Nevertheless, it should be considered among the pedagogic tools to be used complementarily with other types of pedagogic strategies.

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